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Fact Sheet

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Research in VA Geriatrics Centers of Excellence

The aging of the veteran population is a major challenge confronting the Department of Veterans Affairs (VA). Today, 9.2 million veterans are age 65 or older, representing 38 percent of the total veteran population. By 2033, the proportion of older veterans will increase to 45 percent of the total. As in the general U.S. population, those age 85 or older (the "old-old") are the fastest growing segment of the veteran population, representing 4 percent of current veterans. The number of veterans age 85 or older is expected to exceed 1 million by the end of 2006 and rise to a peak of 1.4 million in 2033.

Anticipating the impact of older veterans on its health-care system, VA has been in the forefront of research on aging.

VA established the Geriatric Research, Education and Clinical Center (GRECC) program in 1975 to increase basic knowledge of the aging process, share that knowledge with other health care providers, and improve the overall quality of care for elderly veterans. VA research includes biomedical, applied clinical, health services and rehabilitation research.

Today, VA's 21 GRECCs lead in gerontology and geriatrics, applying basic research to clinical programs. These programs benefit not only older veterans, but elderly people everywhere. VA researchers' work has influenced treatment for diseases affecting older veterans and improved the ways health care is delivered to meet their unique needs.

Some researchers presented their recent findings at special GRECC symposia during the annual meeting of the Gerontological Society of America in Orlando, Fla., in November 2005. These symposia highlight leading-edge investigations underway at VA's geriatrics centers of excellence.

Dementia: Advances in Early Diagnosis and End of Life Care Issues

The pathology of Alzheimer's disease reportedly starts several years before symptoms become obvious. Early diagnosis is crucial to develop effective treatment and prevention strategies. This symposium highlighted recent advances from both animal and human research in brain imaging techniques targeting preclinical diagnosis, before symptoms are seen. It also summarized emerging research issues at the other end of the course of dementia, in end of life care for persons with advanced dementia.

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At the Madison, Wis., GRECC, Dr. Sterling Johnson and other researchers are trying to determine how early the brain's hippocampus – the region involved in memory – is affected by Alzheimer's disease. The researchers used functional magnetic resonance imaging (fMRI) to examine the hippocampus in healthy middle-aged adults engaged in memory tasks. Those without a first-degree relative with dementia showed more activation of their hippocampus than those who had a parent with Alzheimer's. The study suggested that memory-related brain changes take place about 20 years before the disease takes hold in people at risk and highlighted the need for early detection and treatment. This is the first study of its kind.

Early detection and possibly prevention of Alzheimer's is the hoped-for result of research at the Sepulveda, Calif., GRECC. There, Dr. Gregory Cole and his colleagues are using brain imaging with positron emission tomography (PET) to test whether certain protein aggregates can be stained to diagnose Alzheimer's years before it can be diagnosed now. They have developed a molecule to enable PET scans to detect tangles and plaques in diseased brains. This method may be used to assess the effectiveness of new anti-amyloid (protein) treatments, as well as a means of diagnosing early and preclinical stages of Alzheimer's.

At the Birmingham, Ala., GRECC, Dr. Christine Ritchie has examined end-of-life care for people with advanced dementia and identified questions she believes research should answer to integrate palliative care into the continuum of care. Because terminal dementia comes with a slow decline, many patients and caregivers don't receive support for a variety of issues, including symptom recognition and control, nutrition, and guidance on invasive therapies or palliative services. Continuing caregiver education is needed to reduce suffering for patients. Ritchie also called for research into the best ways to help grieving caregivers prior to and after the death of their loved ones. Dementia caregivers are more likely than others to experience complicated grief and health problems.

Osteoporosis: New Diagnosis and Treatment Approaches

Osteoporosis is a common skeletal disease affecting more than 10 million people in the United States. The decline in bone strength increasing the risk of fractures causes loss of function and reduced quality of life in many older veterans, and many VA GRECCs are working to understand and treat the disease. At this symposium, VA investigators presented four promising avenues of research.

At the Miami, Fla., GRECC, Dr. Bruce Troen is studying a particular protein, Cathepsin K, which is involved in bone breakdown. In some types of osteoporosis, the breakdown occurs more rapidly than bone formation. He is working to control the action of this protein, and clinical trials are underway to determine if drugs that inhibit the protein reduce the rate of bone loss. This work may lead to new treatments for osteoporosis.

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Also at the Miami, Fla., GRECC, Dr. Guy Howard and colleagues have isolated from adult bone marrow certain stem cells that are capable of becoming osteoblasts – the cell that builds bone. These cells could open the way to adult stem cell therapy for osteoporosis. The researchers are developing ways to give these cells to patients with osteoporosis, to help them build bone to strengthen their skeletons. By adding new bone to a weakened skeleton, such stem cell therapy would be a significant addition to present therapies, which are directed mainly at preserving bone.

At the St. Louis, Mo., GRECC, Dr. Michael Perry III is investigating the effects of alcohol use on the skeleton. While excessive alcohol intake can cause osteoporosis, his group's data show that moderate amounts preserve bone mass. One hormone that regulates bone breakdown is parathyroid hormone, and Dr. Perry's work suggests that moderate intake of alcohol may preserve bone by reducing levels of parathyroid hormones.

At the Durham, N.C., GRECC, Dr. Kenneth Lyles has examined history and physical findings that can help to diagnose osteoporosis and related fractures of the spine. Although there are guidelines suggesting that all women over age 65 should be screened with bone mineral density measurements, less is known about how to identify younger women at risk for osteoporosis. Lyles' group found that the effectiveness of the bone density measurement in diagnosing osteoporosis was increased in women who weighed less than 112 pounds, had fewer than 20 teeth, or had a humped back. They identified other physical measurements that were good indicators of previously unknown vertebral spine fractures.

Frailty: Causes, Prevention and Treatment

Gainesville, Fla., GRECC researchers are working to understand frailty, the inability to take care of oneself. In this symposium, Dr. Thomas Mulligan explained how age-related impairments in various organ systems contribute to the overall condition of frailty. Dr. Stephen Borst is studying the role of hormones in frailty and has found that testosterone deficiency is associated with low muscle mass and impaired strength in older men. Because testosterone replacement therapy may increase the risk of prostate disease, GRECC researchers are studying safer ways to provide that therapy.

Dr. Stephen Nadeau is examining loss of brain function with aging, which can be considered another form of frailty. He has identified strategies to maintain function, such as mental stimulation and avoidance of medications that can impair brain processes.

In addition, Ms. Normal Prieto-Lewis is investigating gait and balance disorders leading to falls, which commonly result from frailty. She has developed a diagnostic strategy to evaluate why an older person fell and what exercise program or other treatment may prevent further falls.

For more information on the VA GRECC Program, please visit www.va.gov/grecc.

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